Publications

Timing of brain death evaluation could be crucial in maintaining organ perfusion for donation. This article presents a case illustrating the role of bedside blood flow monitoring in determining the timing of brain death evaluation, using Ornim’s c-FLOW™ Monitor.


This article describes the development of a new ultrasound-tagged near-infrared light monitor – Ornim’s c-FLOW™, which tracks CBF trends. In parallel, it continuously measures blood pressure and correlates them to produce a real-time autoregulation index. Results suggest that using such a tool, autoregulation boundaries as well as its impairment or functioning can be identified and assessed.


This study evaluates whether excursions of blood pressure from the optimal mean arterial pressure during and after cardiac surgery are associated with post-operative delirium identified using a structured examination.


Ornim’s depth sensitive blood flow measurement technique, based on the analysis of light modulated by ultrasound, is presented in this article and modeled in a computerized simulation. Distinct depth discrimination ability is demonstrated, showing that by using such method one can effectively nullify the contribution of extra-cerebral tissues to the obtained signals, and specifically extract cerebral flow data.

This article demonstrates a relationship between post-operative complications and failure to maintain optimal blood pressure during cardiopulmonary bypass surgery (CPB) and early ICU stay. It was suggested that Individualized blood pressure management based on cerebral autoregulation monitoring during the perioperative period may help improve patients’ outcomes.


This article demonstrates that spectral analysis of phase-coded light signals, tagged by specific ultrasound patterns, enables differentiation of flow patterns at different depths. In-vitro experiments which demonstrate good agreement with simulations’ results, provide a solid validation to Ornim’s depth discrimination ability and suggest that signal contamination originating from extra-cerebral tissue may be eliminated using spectral analysis of ultrasonically tagged light.


An Editorial reviewing Hori, D. et al. “Cerebral Autoregulation Monitoring with Ultrasound-Tagged Near-Infrared Spectroscopy in Cardiac Surgery Patients”. The transcranial Doppler is difficult to use continuously, especially in an environment of electrical noise such as the operating room. Compared with the transcranial Doppler, the UTLight method shown here is easy to apply and this is possibly the most significant contribution of the CFVx to assess autoregulation.


This article demonstrates a statistically significant correlation and agreement between cerebral blood flow (CBF) autoregulation monitored by Ornim’s CerOx, compared with TCD-based Mx.

9. Hopkins, T. “A Preliminary Evaluation of the Cost-Effectiveness of A Noninvasive Continuous Cerebral Perfusion Monitor”. Accepted by the Society of Neuroscience in Anesthesiology and Critical Care, to be presented at the SNACC Conference, October 2015, San Diego, CA.
This article describes an innovative method of evaluating the cost-effectiveness of the fixed and variable investment necessary to support adding a non-invasive cerebral perfusion monitoring device to a hospital.


The results of this study suggest that Ornim’s c-FLOW™ monitor may be a helpful tool in outlining autoregulation, its reactivity and boundaries. This indicates that Ornim’s c-FLOW™ monitor may become a handy tool in clinical practice for individualized management of blood pressure where cerebral autoregulation may be compromised.


This article shows that monitoring and individualization of cerebral perfusion parameters is a requisite for maintenance of optimal perioperative cerebral perfusion, and that real-time detection of cerebral autoregulation demonstrates a significant role in patient outcomes in various settings. Also demonstrated in this article is an excellent concordance of CFIx with TCD-derived Mx for detection of cerebral autoregulation and LLA (lower limit of cerebral autoregulation).


The findings of this study support the notion that acousto-optic monitoring yields valid real-time measures of changes in CBF in humans. This study shows differences in CBF during certain periods of anesthesia, when brain perfusion can be compromised.

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The findings of this study suggest that Ornim’s novel technology, UTLight™, can quickly and accurately assess cerebral blood flow non-invasively in stroke patients receiving salvage therapy (EVT, ra-TPA). As such, it may be used to optimize cerebral blood flow in critical ill patients in general, and assess reperfusion in stroke patients in particular.


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This article presents and validates a novel comprehensive simulation, uniting the influence of Brownian motion, blood flow and US on light transmitted through a tissue. This simulation may provide valuable data for various optical-based applications and may assist in quantification of non-invasive measurements of blood flow in methods that combine light and ultrasound.

This study demonstrates that the correlation between Ornim’s CerOx measurements and the jugular bulb venous measurements of oxygen saturation indicate that the CerOx may be able to provide an estimation of cerebral oxygenation status in a non-invasive manner.


This article suggests that Ornim’s CerOx flow monitoring device, together with a continuous blood pressure input, may be a helpful tool in outlining autoregulation, its reactivity and boundaries. It is also suggested that the CerOx may come as a handy tool for individualized management of blood pressure in clinical settings, where cerebral autoregulation and cerebral perfusion may be compromised.


This article suggests that cerebral blood flow (CBF) and low limit cerebral autoregulation (LLA) can be detected continuously and non-invasively using UT-NIRS technology.


This study shows the sensitivity of UT-NIRS to detect changes in CBF in response to acetazolamide, a drug known for its effect on intracerebral blood flow. In this study, UT-NIRS detected an increase in CFI following an acetazolamide bolus. CFI changes correlated with CBF measure with 133Xe-SPECT at 15 min after acetazolamide. ROC curve analysis for detecting an increase in CFI following acetazolamide demonstrated a very good discrimination power.


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also suggested that the CerOx may come as a handy tool for individualized management of blood pressure in clinical settings, where cerebral autoregulation and cerebral perfusion may be compromised.


   *This article demonstrates a stable and reproducible liquid tissue mimicking phantom, optimized for applications involving both ultrasound and light waves. The phantom was shown to be stable during the measurement.*


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This article presents a novel, non-invasive method for measuring blood flow based on the accousto-optic effect, using ultrasound modulated diffused light. Its benefits are deep issue sampling, continuous real-time measurement, simplicity of apparatus and ease of operation. This study demonstrates a high linear correlation between the calculated flow index (CFI), defined by the UTL curves, and the actual flow rated in an artificial flow phantom.


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This presentation describes a novel method for continuously and non-invasively measuring flow in deep tissue based on ultrasound modulated diffused light. Data demonstrate a linear correlation of CFI to flow in channels deeper than 1cm in a synthetic phantom, in addition to a very good in-vivo correlation to laser Doppler readings.

In clinical scenarios such as resuscitation, where cerebral perfusion may be compromised, continuous non-invasive monitoring of CBF is feasible during treatment, and may provide crucial information to caregivers, alter treatment and change neurological outcome.


* Research was awarded Third Place at the 2010 AANS Annual Meeting in the category of Trauma/Critical Care


Continuous monitoring with CerOX3110 is safe and feasible in neurocritical care setting. It has the potential of providing information about cerebral metabolism needed for close monitoring and management of patients with severe brain injury.


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   *In this presentation, the advantages of cerebral oximetry in neurocritical care setting are demonstrated.*